UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 3503

CSAH NO. 24

OVER THE

CHANNEL BETWEEN DETROIT LAKE AND DEAD SHOT BAY

DISTRICT 4 - BECKER COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 47)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 3503, Piers 1 through 3, were found to be in good condition with no defects of structural significance observed. The steel pipe piles exhibited 100 percent coating failure and light surface corrosion around and below the waterline. Generally light timber debris was scattered throughout the piles on the channel bottom at all piers. The channel bottom appeared to be in stable condition with no evidence of significant scour.

INSPECTION FINDINGS:

(A) The protective coating on the cast-in-place steel pipe piles of all piers exhibited signs of initial breakdown from the top of the pile to the channel bottom.

(B) Random rust nodules, 1/4 inch to 1 inch in diameter, were observed covering over 50 percent of the surface area of the piles from 10 feet below the waterline to the channel bottom, and over 10 to 20 percent of the surface area from the top of the pile to 10 feet below the waterline.

(C) Timber debris, up to 12 inches in diameter, was observed scattered throughout the channel bottom at all of the piers.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 3503

Feature Crossed: Channel between Detroit Lake and Dead Shot Bay

Feature Carried: CSAH No. 24

Location: District 4 - Becker County

Bridge Description: The superstructure consists of a four span cast-in-place concrete slab supported by two concrete abutments on piles and three cast-in-place pipe pile bent piers, numbered 1 to 3 starting from the north end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Denis Redzic, Valerie Roustan.

Date: September 17, 2007

Weather Conditions: Cloudy-Rain, 62°F

Underwater Visibility: 3.0 Feet

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 3.

General Shape: Each pier consists of a single line of twelve battered or vertical cast-in-place, concrete filled, steel pipe piles under a common pier cap.

Maximum Water Depth at Substructure Inspected: Approximately 21.4 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the east end of Pier 2.

Water Surface: The waterline was approximately 6.0 feet below reference.
Waterline Elevation = 1333.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/09/07

Item 113: Scour Critical Bridges: Code I/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes X No

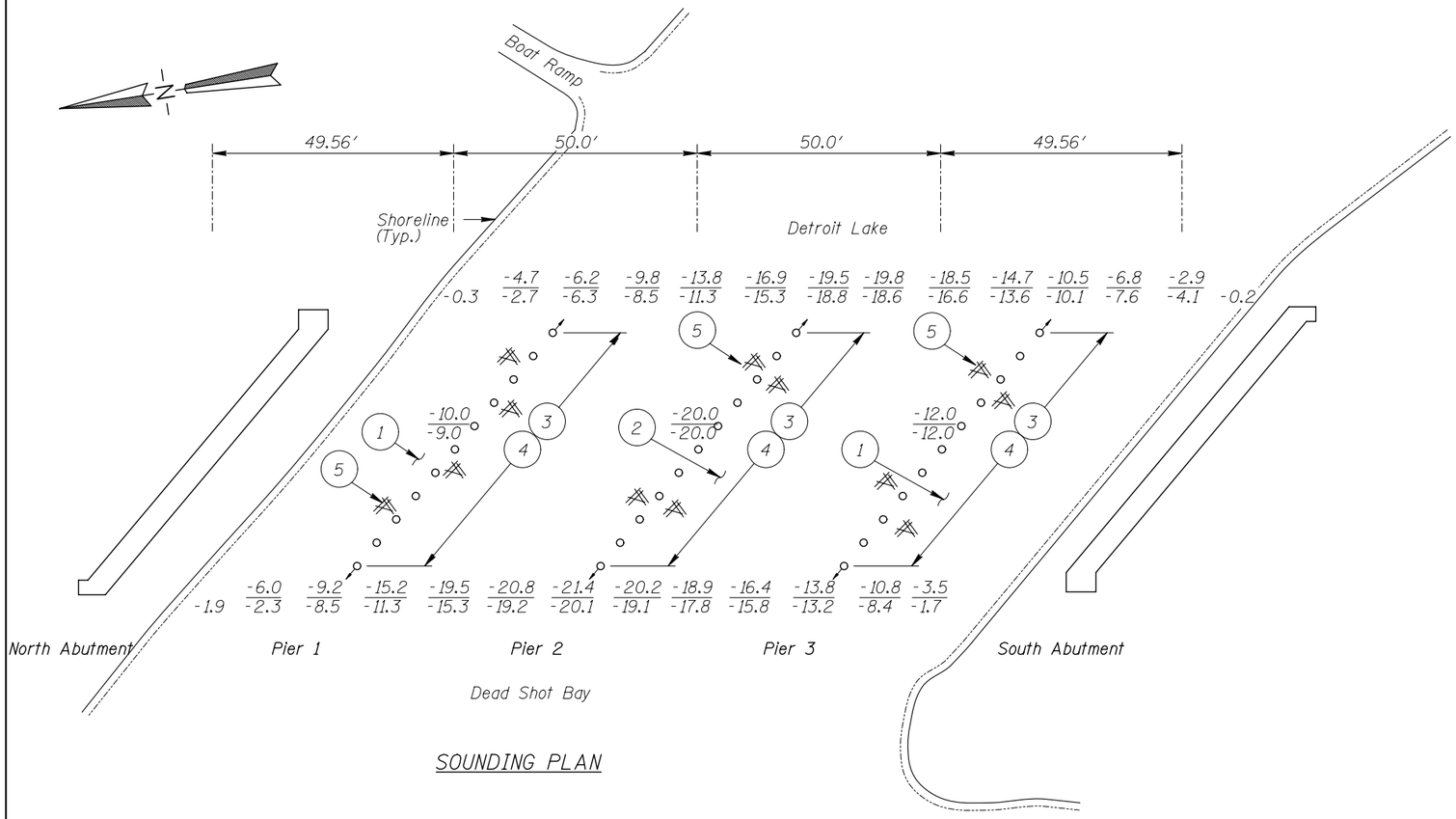
Photograph 1. View of Pier 1, Looking Southwest.


Photograph 2. View of Western End of Pier 1, Looking Southeast.

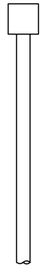
Photograph 3. View of Pier 2, Looking Southwest.

Photograph 4. View of Pier 3, Looking Southwest.

Photograph 5. Typical Coating Failure on the Steel Pipe Piles.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1, 2, and 3 inspected underwater.
2. At the time of inspection on September 17, 2007 the waterline was located approximately 6.0 feet below the top of the pier cap at the east end of Pier 2. This corresponds with a waterline elevation of 1333.4 based on design drawings.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of 6 inch diameter cobbles and sandy silt with up to 1 foot of probe rod penetration.

(2) The channel bottom consisted of sand with up to 6 inches of probe rod penetration.

(3) The steel pipe piles exhibited coating failure with light surface corrosion from top of pile to the channel bottom.

(4) The steel pipe piles exhibited rust nodules, typically 1/4 inch in diameter and up to 1 inch in diameter, over 50 percent of the surface area from 10 feet below the waterline to the channel bottom and over 10 to 20 percent from the top pile to 10 feet below the waterline. Associated pitting, 1/32 inch deep, was observed on all piles.

(5) Timber debris, consisting of logs up to 12 inches in diameter, was scattered throughout the piles of all the piers.

Legend

-2.0 / -5.2	Sounding Depth (9/17/07) / Sounding Depth (10/29/02)
o	16" Diameter Steel Pipe, Cast-in-place Concrete Pile
	Battered 16" Diameter Steel Pipe, Cast-in-place Concrete Pile

Note:

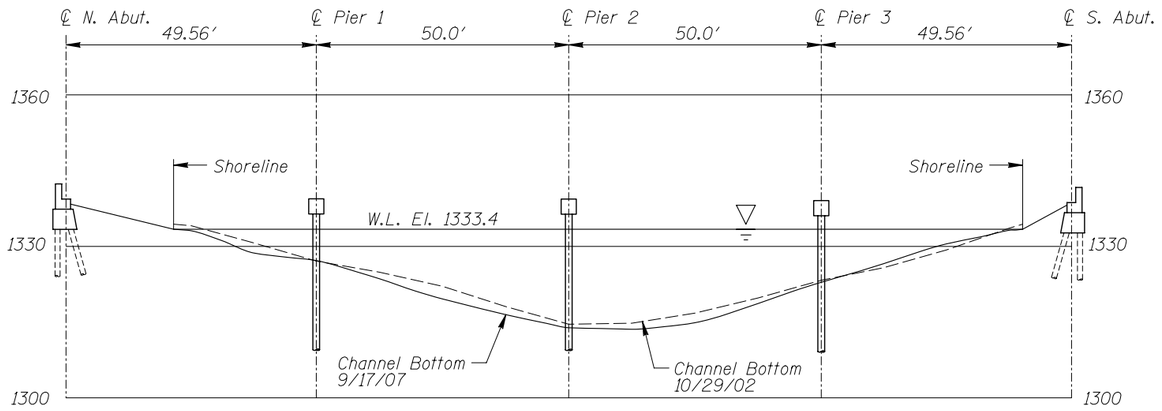
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

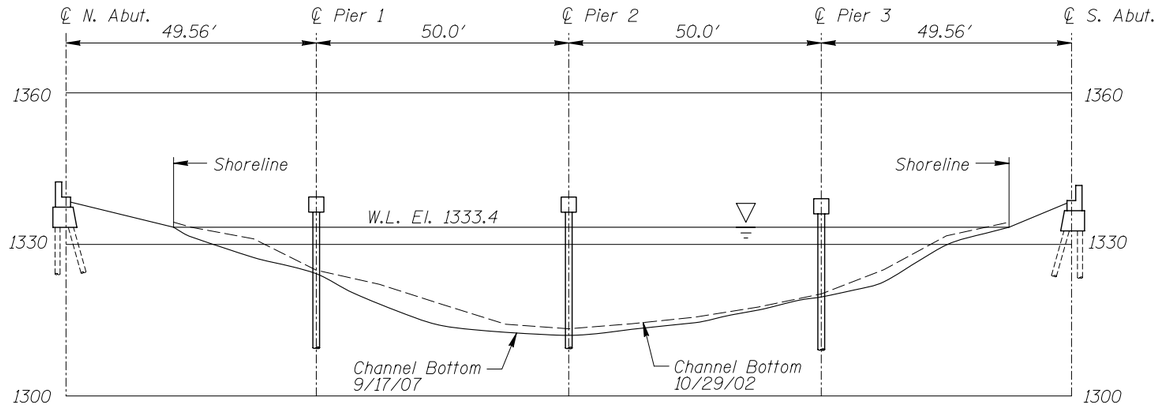
STRUCTURE NO. 03503
OVER DETROIT LAKE AND DEAD SHOT BAY
DISTRICT 4, BECKER COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: SEPT. 2007
Checked By: MDK		Scale: NTS
Code: 522103503		Figure No.: 1



EAST FASCIA PROFILE



WEST FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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EAST AND WEST
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: SEPT. 2007
Checked By: MDK		Scale: 1"=30'
Code: 522103503		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 17, 2007
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.
BRIDGE NO: 3503 WEATHER: Cloudy-Rain, 62° F
WATERWAY CROSSED: Channel between the Detroit River and Dead Shot Bay
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: Denis Redzic, Valerie Roustan
EQUIPMENT: Scuba, Sounding Pole, Camera, u/w Light, Scraper, Probe Rod, Lead Line

TIME IN WATER: 5:50 A.M.
TIME OUT OF WATER: 6:35 P.M.
WATERWAY DATA: VELOCITY Negligible/None
VISIBILITY 3.0 feet
DEPTH 21.4 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 1, 2 and 3
REMARKS: Overall, substructure units inspected were found to be in good condition with no defects of structural significance observed. The steel pipe piles exhibited up to 100 percent coating failure from the top of the pile to the channel bottom. Light surface corrosion, with rust nodules typically 1/4 inch in diameter and up to 1 inch in diameter, was observed over 50 percent of the surface area of the steel pipe piles from 10 feet below the waterline to the channel bottom and over 10 to 20 percent of the surface area from the top of the pile to 10 feet below the waterline. Pitting, 1/32 of an inch deep, was observed on all piles. Timber debris, up to 12 inches in diameter, was observed scattered throughout the channel bottom at all piers. The channel bottom appeared to be in stable condition with no evidence of significant scour.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 3503
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Channel between Detroit Lake and Dead Shot Bay

INSPECTION DATE September 17, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	10.0’	7	N	N	9	N	7	8	8	8	7	7	N	7	N	7	N	N
	Pier 2	21.4’	7	N	N	9	N	7	8	N	N	7	7	N	7	N	7	N	N
	Pier 3	13.8’	7	N	N	9	N	7	8	8	8	7	7	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, substructure units inspected were found to be in good condition with no defects of structural significance observed. The steel pipe piles exhibited up to 100 percent coating failure from the top of the pile to the channel bottom. Light surface corrosion, with rust nodules typically 1/4 inch in diameter and up to 1 inch in diameter, was observed over 50 percent of the surface area of the steel pipe piles from 10 feet below the waterline to the channel bottom and over 10 to 20 percent of the surface area from the top of the pile to 10 feet below the waterline. Pitting, 1/32 of an inch deep, was observed on all piles. Timber debris, up to 12 inches in diameter, was observed scattered throughout the channel bottom at all piers. The channel bottom appeared to be in stable condition with no evidence of significant scour.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.